

**WHAT IS CLAIMED IS:**

1. A method for illuminating an object comprising the following steps:
  - generating a light beam with a laser,
  - injecting the light beam into a optical element which spectrally broadens the light of the light beam and
  - shaping the spectrally broadened light beam to form an illumination light beam.
2. Method according to Claim 1, further comprising the step:
  - adjusting the pulse width of the light pulses.
3. Method according to Claim 1, wherein the optical element consists of photonic band gap material
4. Method according to Claim 1, wherein the optical element consists of a tapered optical fiber.
5. An illuminating instrument comprising: a laser that emits a light beam, a optical element that spectrally broadens the light from the laser and a optical means for shaping the spectrally broadened light into an illumination light beam.
6. Illuminating instrument according to Claim 5, wherein the optical element consists of photonic band gap material
7. Illuminating instrument according to Claim 5, wherein the optical element consists of a tapered optical fiber.
8. An illuminating device comprising: a laser, a microstructured optical element on which the light beam is directed and wherein the microstructured optical element spectrally broadens the light beam and a casing, defining an exit

[illegible]

9. An illuminating device comprising: a laser, a tapered optical fiber into which the light beam is coupled and wherein the tapered optical fiber spectrally broadens the light beam and a casing, defining an exit opening from which the spectrally broadened light beam emerges and wherein the laser and the tapered optical fiber are arranged within the casing.
10. A microscope comprising: an illuminating device for illuminating a preparation having a laser and a optical element on which the light beam is directed, wherein the optical element spectrally broadens the light beam.
11. Microscope according to Claim 10, wherein the microscope is a confocal scanning microscope.
12. Microscope according to Claim 10, wherein the optical element produces entangled photons.
13. A microscope comprising: an objective through which a sample can be illuminated and detected, the objective being arranged in both an illumination beam path and a detection beam path, an illumination pinhole being arranged in the illumination beam path, a detection pinhole being arranged in the detection beam path, an optical component arranged in the illumination beam path, which generates spectrally broadened illumination light, and an essentially polarization-independent and wavelength-independent beam splitter, which is arranged in a fixed position in the illumination beam path and the detection beam path.